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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/960,728	09/24/2001	Dominic Hugo Symes	550-258	4210

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NIXON & VANDERHYE P.C.
1100 North Glebe Road, 8th Floor
Arlington, VA 22201-4714

EXAMINER	
HUISMAN, DAVID J	

ART UNIT	PAPER NUMBER
2183	

DATE MAILED: 07/29/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/960,728	SYMES, DOMINIC HUGO	
	Examiner	Art Unit	
	David J. Huisman	2183	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 September 2001*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-15* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-15* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *24 September 2001* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *9/01, 12/01, 5/02*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. Claims 1-15 have been examined.

Papers Submitted

2. It is hereby acknowledged that the following papers have been received and placed of record in the file: Information Disclosure Statements as received on 9/24/2001, 12/13/2001, and 5/30/2002, Foreign Priority Papers as received on 12/13/2001, and Declaration as received on 12/13/2001.

Specification

3. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

4. The abstract of the disclosure is objected to because of the following: Please remove '[Figure 3]' at the bottom of the abstract. Correction is required. See MPEP § 608.01(b).

5. The disclosure is objected to because of the following informalities: On page 3, line 12, replace "recognises" with --recognizes--. On page 3, line 15, replace "utilising" with --utilizing--. On page 4, line 1, insert --invention-- after "present". On page 6, line 3, replace 'utilise' with --utilize--. On page 6, line 10, replace "multiplex" with --multiplexer--. On page 8, line 6, replace "in" with --is--.

Appropriate correction is required.

Drawings

6. The drawings are objected to because of the following minor informalities: In Fig.1, in the word labeled"P", replace"p3"with --p0--. In Fig.3, for increased clarity, please replace 'b[15+k:k]'with --b[(15+k):k]--. In Fig.4, for increased clarity, please replace"b[31-k:16-k]'with --b[(31-k):(16-k)]--. Also, in Fig.4, the arrows at the top right (under the"K"and the"LSL#K") should be pointing left, thereby signifying a left shift, as opposed to a right shift. Finally, Fig.4 does not seem to be accurate because the arrows from Rn to Rd and Rm to Rd are incorrect. That is,"a"appears to be coming from Rn, however, the arrows show"b[31-k:16-k]'coming from Rn. Likewise, the arrows show that"a"is being provided by Rm, which is incorrect. Corrected drawing sheets are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as"amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. The replacement sheet(s) should be labeled"Replacement Sheet"in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

7. Claim 15 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. More specifically, claim 14 claims decoding and executing an instruction. An instruction is inherently part of a computer program which is used to control a computer, which is what is claimed in claim 15.

Claim Rejections - 35 USC § 112

8. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

9. Claim 4 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention without undue experimentation. More specifically, claim 4 recites that the shift operand can specify **any** amount of arithmetic right shift to apply to the data word. The examiner has found no support in the specification for such a limitation. Clearly, the amount of right shift is limited by the size of the operand. Therefore, in this sense, the operand cannot specify any amount of shift because the specified amount is limited to the finite size of the operand. In addition, what if the shift amount is greater than the number of bits in the data word? Shifting a 32-bit data word 100 times to the right, for

instance, serves no more a purpose than shifting the data word just 32 times to the right. Consequently, the applicant should make the examiner aware of a particular portion of the specification which supports such a claim or this claim should be cancelled or amended to more accurately reflect applicant's specification.

10. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

11. Claim 4 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. More specifically, claim 4 recites that the shift operand can specify **any** amount of arithmetic right shift to apply to the data word. Clearly, the amount of right shift is limited by the size of the operand. Therefore, in this sense, claim 4 is indefinite because the operand cannot specify any amount of shift because the specified amount is limited to the finite size of the operand.

12. Claim 15 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention because it is not clear whether the claim is independent or dependent. The claim should be rewritten in a more appropriate manner. Claim 15 is assumed to be dependent for purposes of this examination.

Claim Rejections - 35 USC § 101

13. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

14. Claim 15 is rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. That is, the computer program is not tangibly embodied on a computer-readable medium and in addition, the computer program should comprise instructions, which when executed, perform the method of claim 14.

Claim Rejections - 35 USC § 102

15. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

16. Claims 1-12 and 14-15 are rejected under 35 U.S.C. 102(b) as being anticipated by Intel, "IA-64 Application Developer's Architecture Guide," May 1999 (herein referred to as Intel).

17. Referring to claim 1, Intel has taught apparatus for processing data, said apparatus comprising:

(i) a shifting circuit. See page 7-158 and note that data is shifted.

(ii) a bit portion selecting and combining circuit. Again from page 7-158, note that portions are selected and combined.

(iii) an instruction decoder responsive to an instruction to control said shifting circuit and said bit portion selecting and combining circuit to perform an operation upon a data word Rn and a data word Rm (it is inherent that an instruction decoder exists in order to decode instructions prior to execution. The decoder, in response to the pshradd2 instruction, shown in page 7-158, will

control the system such that the disclosed operation will be performed), wherein said operation yields a value given by:

(iv) selecting a first portion of bit length A of said data word Rn extending from one end of said data word Rn. See page 7-158 and note that the most significant bits of register R3 (Rn) are selected and stored in array "y", thereby forming a first portion, which depending on interpretation, comprises either 16 or 32 bits. These bits, since they are the most significant, start from one end of Rn.

(v) selecting a second portion of bit length B of said data word Rm subject to an arithmetic right shift specified as a shift operand within said instruction. See page 7-158 and note that the least significant bits of register R2 (Rm) are selected and stored in array "x", thereby forming a first portion, which depending on interpretation, comprises either 16 or 32 bits. This portion is then subject to a right shift by count2 bits, which is an operand specified within the instruction. This shift is an arithmetic shift because sign bits are shifted in (in a logical shift, only 0s are shifted in).

(vi) combining said first portion and said second portion to form respective different bit position portions of an output data word Rd. From page 7-158, it can be seen that the two portions are modified via addition and then concatenated (combined) and stored in destination R1 (Rd). It should be noted that the use of the word "comprising" in applicant's claim allows for anticipation by Intel even though Intel's portions are modified before they are combined.

18. Referring to claim 2, Intel has taught an apparatus as described in claim 1. Intel has further taught that said first portion extends from a most significant bit end of said data word Rn. For instance, see page 7-158 and note that the 32 most significant bits of register R3 (Rn) are

selected and stored in y[3] and y[2], each holding 16 of the 32 bits. These bits, since they are the most significant, start from one end of Rn.

19. Referring to claim 3, Intel has taught an apparatus as described in claim 1. Intel has further taught that said first portion extends from a least significant bit end of said data word Rn. Even though the example given in the rejection of claim 1 above includes selecting the most significant bits of Rn, the least significant bits of Rn are also selected and stored in array "y". These least significant bits may alternatively be referred to as the first portion.

20. Referring to claim 4, Intel has taught an apparatus as described in claim 1. Intel has further taught that said shift operand can specify any amount of arithmetic right shift to apply to said data word Rm. See page 7-158 and note that the count2 operand specifies any of 1, 2, or 3 for the amount of bits the data will be shifted.

21. Referring to claim 5, Intel has taught an apparatus as described in claim 1. Intel has further taught that said first portion and said second portion abut within said output data word Rd. See page 7-158 and note at the bottom of code snippet that the portions, after being modified, are concatenated and stored in the 64-bit register R1 (Rd).

22. Referring to claim 6, Intel has taught an apparatus as described in claim 5. Intel has further taught that said output data word has a bit length of C and C = A+B. Note from page 7-158 that the output data word is 64 bits in length (four additions occur on four 16-bit words) and the first portion A and second portion B are each 32 bits in length.

23. Referring to claim 7, Intel has taught an apparatus as described in claim 6. Intel has further taught that A = B. Both A and B are 32-bit portions.

24. Referring to claim 8, Intel has taught an apparatus as described in claim 1. Intel has further taught that A = 16. See page 7-158 and note that the first portion selected from R3 (Rn) comprises 16 bits. More specifically, the first portion would be bits 63:48 of R3, for instance, which are then stored in y[3].

25. Referring to claim 9, Intel has taught an apparatus as described in claim 1. Intel has further taught that B = 16. See page 7-158 and note that the second portion selected from R2 (Rm) comprises 16 bits. More specifically, the second portion would be bits 15:0 of R2, for instance, which are then stored in x[0].

26. Referring to claim 10, Intel has taught an apparatus as described in claim 1. Intel has further taught that said instruction is a single-instruction-multiple-data instruction. See page 7-158 and note that with one instruction, multiple additions are formed.

27. Referring to claim 11, Intel has taught an apparatus as described in claim 1. Intel has further taught that said instruction combines a data value pack operation with a shift operation. See page 7-158 and note that data is at least shifted and packed into a destination operand R1 (Rd).

28. Referring to claim 12, Intel has taught an apparatus as described in claim 1. Intel has further taught that said shifting circuit is upstream of said selecting and combining circuit in a data path of said apparatus. Looking at page 7-128, it can be seen (in the operation program) that the shifting occurs before the combination. That is, the shifting is in the for loop while the combination is outside and after the for loop. Therefore, the shifting circuit is upstream of the selecting and combining circuit.

29. Referring to claim 14, Intel has taught a method of data processing, said method comprising the steps of decoding and executing an instruction that yields a value given by:

(i) selecting a first portion of bit length A of said data word Rn extending from one end of said data word Rn. See page 7-158 and note that the most significant bits of register R3 (Rn) are selected and stored in array "y", thereby forming a first portion, which depending on interpretation, comprises either 16 or 32 bits. These bits, since they are the most significant, start from one end of Rn.

(ii) selecting a second portion of bit length B of said data word Rm subject to an arithmetic right shift specified as a shift operand within said instruction. See page 7-158 and note that the least significant bits of register R2 (Rm) are selected and stored in array "x", thereby forming a first portion, which depending on interpretation, comprises either 16 or 32 bits. This portion is then subject to a right shift by count2 bits, which is an operand specified within the instruction. This shift is an arithmetic shift because sign bits are shifted in (in a logical shift, only 0s are shifted in).

(iii) combining said first portion and said second portion to form respective different bit position portions of an output data word Rd. From page 7-158, it can be seen that the two portions are modified via addition and then concatenated (combined) and stored in destination R1 (Rd). It should be noted that the use of the word "comprising" in applicant's claim allows for anticipation by Intel even though Intel's portions are modified before they are combined.

30. Referring to claim 15, Intel has taught a method as described in claim 14. In addition, the instruction shown on page 7-158 of Intel performs the method of claim 14. This instruction would inherently be found in a computer program on a computer-readable medium.

Claim Rejections - 35 USC § 103

31. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

32. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Intel, as applied above.

33. Referring to claim 13, Intel has taught an apparatus as described in claim 12. Intel has not explicitly taught that said selecting and combining circuit is disposed in parallel to an arithmetic circuit within said data path. However, from a software point of view, Official Notice is taken that pipelining and its advantages are well known and accepted in the art. More specifically, in a pipelined machine, multiple instructions execute in parallel using different components within the system. This increases throughput because at any given time, multiple instructions are executing, whereas with serial execution, only one instruction is executed at a time. Therefore, in order to increase throughput, it would have been obvious to one of ordinary skill in the art at the time of the invention to dispose the selecting and combining circuit in parallel to an arithmetic circuit within said data path. By doing so, one instruction utilizes the arithmetic unit while another instruction utilizes the shifter. If these resources are able to operate on data in parallel, then the resources are disposed in parallel. Clearly, resources are more efficiently utilized as they are not sitting idle as often as they would be during serial execution.

On the other hand, if taken from a hardware point of view, the examiner asserts that it is

merely a design choice as to how each component on the chip should be arranged. As shown in In re Japikse 86 USPQ 70 (CCPA 1950), to shift location of parts is generally not given patentable weight or would have been an obvious improvement (perhaps to minimize total chip area consumed and/or wire length). Consequently, it would have been obvious to one of ordinary skill in the art at the time of the invention to place the arithmetic circuit in parallel with the selecting and combining circuit.

Conclusion

34. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Applicant is reminded that in amending in response to a rejection of claims, the patentable novelty must be clearly shown in view of the state of the art disclosed by the references cited and the objections made. Applicant must also show how the amendments avoid such references and objections. See 37 CFR § 1.111(c).

Philips Electronics,"TriMedia - TM1000 Preliminary Data Book," 1997, has taught multiple instructions in which portions of two operands are shifted, combined, and stored in a destination operand.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David J. Huisman whose telephone number is (703) 305-7811. The examiner can normally be reached on Monday-Friday (8:00-4:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie Chan can be reached on (703) 305-9712. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

DJH
David J. Huisman
July 13, 2004

RICHARD L. ELLIS
PRIMARY EXAMINER